



Aviation and the Environment: A Public Interest Perspective on Local Air Quality Concerns

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Center for Clean Air Policy

- ◆ Non-profit research and advocacy group.
- ◆ Founded in 1985 to help find a market-based approach to reducing acid rain.
- ◆ Working to apply similar approaches to reducing ground-level ozone, greenhouse gases, air toxics.
- ◆ Active participant in Ozone Transport Assessment Group (OTAG); leading dialogue on greenhouse gas emissions trading.



Key Issues to Consider

- ◆ States and localities face major challenge in addressing tropospheric ozone problem.
- ◆ All sources of emissions reductions need to be evaluated for effectiveness, cost, trade-offs with other pollutants (e.g., CO₂).
- ◆ Aviation is small, but growing source of emissions, that could be incorporated into trading, or other market-based system.



Tropospheric Ozone is Top Local Air Quality Concern

- ◆ Ozone linked to serious human health impacts:
 - decreased lung function
 - increased respiratory symptoms
 - lung inflammation and possible long-term damage
- ◆ Elderly and children are particularly vulnerable.
- ◆ Damages forests and produces several hundred millions of dollars in crop yield loss per year.
- ◆ Chemistry is complicated; NO_x plays key role, especially in transport issue.



Ozone Problem Poses Major Challenge to States and Localities

- ◆ Efforts to address ozone on-going since 1970's, but problem persists.
- ◆ 70 million people living in areas that exceed the federal standard for ozone (1995).
- ◆ Stationary, mobile and area sources are all being squeezed to minimum emissions levels, but this still not enough to meet our clean air goals.



All Potential NO_x Reduction Sources Need to be Evaluated

- ◆ Proposed ozone transport “SIP call” assumes:
 - 69% cut in NO_x from utilities
 - 33% cut in NO_x from non-utility point sources
 - 13% cut in NO_x from highway sources (beyond significant reductions made in past 2 decades).
 - 14% cut in NO_x from non-road sources -- *including “small” sources such as locomotives, small engines*
- ◆ Additional efforts still needed for attainment -- aviation emissions not yet fully evaluated.



“Multiple Benefits” of NO_x Reductions

- ◆ NO_x reductions are not just an ozone issue:
 - ozone (smog) related respiratory problems, ecosystem damage
 - acid rain, related release of heavy metals in aquatic ecosystems
 - eutrophication (over-enrichment) of coastal waters
 - nitrification (nitrogen saturation) of forests
 - particulate-related respiratory damage
 - regional haze
 - climate change, from O₃ , N₂O
 - stratospheric ozone depletion



Aviation is a Small, but Growing Source of Emissions

- ◆ Commercial aircraft account for 1% to 2% of total U.S. NO_x emissions.
- ◆ Industry is growing rapidly, at an annual rate of 6.5% (worldwide commercial traffic).
- ◆ Improvements in energy efficiency and engine design not enough to offset increases in miles traveled.



New Challenge: Look for Cost-Effective Reduction Options from Aviation

- ◆ Several available options for reducing NO_x emissions from aviation:
 - Adopt existing or new technology.
 - Retrofit current fleet.
 - Modify flight operation, airport management.
- ◆ Consider integration with trading program, other market-based approaches.
- ◆ Can achieve environmental benefits along with continued growth.



Consider Trade-Offs with CO₂ Emissions, Other Impacts

- ◆ Aviation is also a growing source of greenhouse gas emissions, primarily CO₂.
- ◆ NO_x emissions reductions usually mean CO₂ increases, but latest developments show promise for reducing both.
- ◆ Need to think holistically, consider trade-offs and benefits (e.g., hydrocarbons, soot, cirrus clouds).



Issues Call for Near-Term Action

- ◆ Ozone problem poses “here and now” challenge.
- ◆ Obligations related to climate change may call for major reductions by 2008-2012.
- ◆ Focus should be on developing strategy that will allow for near-term action on ozone and move us forward on addressing climate change.